

AMENDMENTS TO THE CLAIMS

3/26/04

1. (currently amended) A genetically engineered mutant *C. fetus* strain derived from strain 23D which has an ATCC designation PTA-4754 (~~PTA-4754~~), said mutant strain contains a DNA cassette inserted into the coding sequence of a *sapA* homolog of said 23D strain, wherein said DNA cassette encodes a heterologous protein and expression of said DNA cassette results in surface expression of a chimeric protein comprising a 5' LPS-binding region of said *sapA* homolog, said heterologous protein and a 3' secretion signal region of said *sapA* homolog.

2-4. (canceled)

3/29/04

3. (currently amended) The mutant *C. fetus* strain of claim 1, wherein said heterologous protein is an immunogen of a pathogen selected from the group consisting of *Salmonella*, *Shigella*, *Campylobacter jejuni*, *E. coli* 0157:H7, human immunodeficiency virus (HIV), and simian immunodeficiency virus (SIV) and ~~animal~~ pathogens.

6-7. (canceled)

<sup>2</sup>  
~~8.~~ (original) The mutant *C. fetus* strain of claim 1, wherein said protein is selected from the group consisting of an antigen and a therapeutic agent.

<sup>4</sup>  
~~9.~~ (previously amended) A method of immunizing a host to develop mucosal and systemic immune responses to an immunogen carried by the mutant strain of claim 5, comprising the step of administering to said host the mutant strain of claim ~~5.~~<sup>3</sup>

<sup>5</sup>  
~~10.~~ (currently amended) A mutant *C. fetus* strain derived from recA mutant strain 97-211 which has an ATCC designation PTA-4753 (PTA-4753), said mutant *C. fetus* strain expresses only one S-layer protein encoded by one *sapA* homolog due to a *recA* mutation that results in no functional RecA protein expression.

<sup>6</sup>  
~~11.~~ (currently amended) The mutant *C. fetus* strain of claim ~~5~~<sup>10</sup>, ~~further comprises wherein~~ a DNA cassette is inserted into the coding sequence of ~~[[a]]~~ said *sapA* homolog ~~of said strain~~, said DNA cassette encodes a heterologous protein and expression of said DNA cassette results in surface expression of a chimeric protein

comprising a 5' LPS-binding region of said *sapA* homolog, said heterologous protein and a 3' secretion signal region of said *sapA* homolog, said heterologous protein.

8  
12. (currently amended) A mixture of mutant *C. fetus* strains derived from *recA* mutant strain 97-211 which has an ATCC designation PTA-4753 (PTA-4753), wherein due to *recA* mutation there is no functional RecA protein expression in each of said strains, each of said strains ~~further~~ comprises a DNA cassette inserted into the coding sequence of a *sapA* homolog of said strain, said DNA cassette encodes a different heterologous protein in each of said mutant strains and expression of said DNA cassette results in surface expression of a chimeric protein comprising a different heterologous protein in each of said mutant strains.

7  
13. (previously amended) A method of immunizing a host to develop mucosal and systemic immune responses to the heterologous protein carried by the mutant strain of claim 11<sup>6</sup>, comprising the step of administering to said host the mutant strains of claim 11<sup>6</sup>.

14. (canceled)

<sup>9</sup>  
15. (currently amended) A strain of *Escherichia coli* (PTA-4750) having an ATCC designation PTA-4750 modified to express the surface array proteins C, D, E and F of *C. fetus* strain 23D, wherein said surface array proteins are encoded by the pIR100 plasmid contained in said strain of *E. coli*.

<sup>10</sup>  
<sup>9</sup>  
16. (currently amended) The *Escherichia coli* of claim 15, further comprises a chimeric protein encoded by sequences comprising a 5' LPS-binding region of a *sapA* homolog of *C. fetus* strain 23D of ATCC designation PTA-4754, a 3' secretion signal region of said *sapA* homolog and sequence encoding a heterologous protein inserted between said binding region and said signal region.

<sup>11</sup>  
17. (previously amended) A method of immunizing a host to generate immune responses to the heterologous protein carried by the *Escherichia coli* of claim <sup>10</sup>16, comprising the step of administering to said host the *Escherichia coli* of claim <sup>10</sup>16.

18. (canceled)